



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,896	03/30/2004	Jin-seok Lee	1572.1246	1334
21171	7590	10/13/2006	EXAMINER	
STAAS & HALSEY LLP SUITE 700 1201 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			ZERVIGON, RUDY	
			ART UNIT	PAPER NUMBER
			1763	

DATE MAILED: 10/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/811,896

Applicant(s)

LEE ET AL.

Examiner

Rudy Zervigon

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4,5,11,14,15 and 20-29 is/are pending in the application.
- 4a) Of the above claim(s) 21-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4,5,11,14,15 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. This application contains claims 21-29 drawn to an invention nonelected with traverse in Paper No. March 10 , 2006. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1, 4, 5, 11, 14, 15, and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 1 recites the limitation “second supply hole”. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 1-4, and 6-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Dhindsa; Rajinder et al. (US 6245192 B1). Dhindsa teaches an etching apparatus (Figure 3-5; column 3, line 64 - column 5, line 41) for a semiconductor wafer (“semiconductor substrate”; claim 1, Figure 3; not numbered), comprising: a vacuum chamber (“reaction chamber”, claim 1;

Art Unit: 1763

Figure 3); a support (Figure 3; not numbered) for the semiconductor wafer (“semiconductor substrate”; claim 1, Figure 3; not numbered) in the chamber (“reaction chamber”, claim 1; Figure 3); and a gas injector (26; Figure 4; column 4, lines 10-29), wherein the gas injector (26; Figure 4; column 4, lines 10-29) comprises: a gas supplier (20; Figure 4) including a first gas supply hole (60; Figure 4) and a second gas supply hole (64; Figure 4); a gas distributor plate (56a; Figure 4) having a plurality of distribution holes (80; Figure 4) formed therein, the gas distributor plate (56a; Figure 4) being positioned opposite and below the gas supplier (20; Figure 4) and forming a first gas therebetween; a first loop-type partition wall (wedge pieces 72; Figure 4) formed in the first gap (70; Figure 4) between the gas supplier (20; Figure 4) and the gas distributor plate (56a; Figure 4), the first loop-type partition wall (wedge pieces 72; Figure 4) forming a first central zone (62; Figure 4) and a first edge zone (66; Figure 4), the first central zone (62; Figure 4) being connected to the first gas supply hole (60; Figure 4) and the first edge zone (66; Figure 4) being connected to the second gas supply hole (64; Figure 4); a showerhead (56B; Figure 4) connected to the vacuum chamber (“reaction chamber”, claim 1; Figure 3), the showerhead (56B; Figure 4) being positioned opposite and below the gas distributor plate (56a; Figure 4) forming a second gap (77, Figure 4) therebetween; a second loop-type partition wall (wedge elements 78; Figure 4) formed in the second gap (77, Figure 4) between the gas distributor plate (56a; Figure 4) and the showerhead (56B; Figure 4), the second loop-type partition wall (wedge elements 78; Figure 4) forming a second central zone (76, Figure 4) and second edge zone (66, Figure 4,5 - extends to both 56a,B) corresponding to the first central zone (62; Figure 4) and the second edge zone (66, Figure 4,5 - extends to both 56a,B), wherein an amount of reaction gas supplied to the first central zone (62; Figure 4) and the first edge zone

Art Unit: 1763

(66; Figure 4) through the first and second gas supply hole (64; Figure 4)s of the gas supplier (20; Figure 4) is independently controlled (“controller for process gas”; Figure 3), as claimed by claim 1

Dhindsa further teaches:

- i. The etching apparatus (Figure 3-5; column 3, line 64 - column 5, line 41) according to claim 1, wherein the amount of reaction gas supplied to the gas injector is controller to affect at least one of uniformity of density of plasma, deposition speed, and etching speed – column 6, lines 37-55, as claimed by claim 4
- ii. The etching apparatus (Figure 3-5; column 3, line 64 - column 5, line 41) according to claim 1, further comprising an MFC (MFC1, MFC2; Figure 5) independently (column 5; lines 52-55) controlling amounts of reaction gases respectively supplied into the first central zone (central zone of 56b; Figure 4; column 5, lines 13-19) and the first edge zone (78; Figure 4; column 5, lines 21-37), as claimed by claim 11
- iii. The etching apparatus (Figure 3-5; column 3, line 64 - column 5, line 41) according to claim 1, further comprising a control valve (MFC1,2; Figure 3, 5) independently supplying the reaction gas into the first central zone (central zone of 56b; Figure 4; column 5, lines 13-19) and the first edge zone (78; Figure 4; column 5, lines 21-37), as claimed by claim 14
- iv. The etching apparatus (Figure 3-5; column 3, line 64 - column 5, line 41) according to claim 14, wherein the control valve (MFC1,2; Figure 3, 5) is controlled automatically, as claimed by claim 15

Claim Rejections - 35 USC § 103

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Claims 5, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dhindsa; Rajinder et al. (US 6245192 B1) in view of Okayama; Nobuyuki et al. (US 6334983 B1). Dhindsa is discussed above. Dhindsa does not teach:

- i. The etching apparatus (Figure 3-5; column 3, line 64 - column 5, line 41) according to claim 1, wherein a plurality of the gas distributor plates (56a,b; Figure 4; column 5, lines 13-19) are provided between the gas suppliers (60,64; Figure 4; column 5, lines 13-19) and the showerhead (22; Figure 4; column 6, lines 37-55), as claimed by claim 5
- ii. The etching apparatus (Figure 3-5; column 3, line 64 - column 5, line 41) according to claim 9, wherein the gas distributor plate (assumed “gas distributor plate” 56b; Figure 4; column 5, lines 13-19) contains aluminum alloy, and the showerhead (22; Figure 4; column 6, lines 37-55) contains silicon, as claimed by claim 20

Okayama teaches a gas distribution arrangement (Figure 6) for a plasma etching process (column 1, lines 5-10). Specifically, Okayama teaches a gas distributor plate (302; Figure 6; column 12, lines 16-23) contains aluminum alloy, and a showerhead (301; Figure 6; column 12, lines 16-23) contains silicon.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Okayama's preferred materials and to reproduce Dhindsa's gas distributor plate (56b; Figure 4; column 5, lines 13-19).

Art Unit: 1763

Motivation to use Okayama's preferred materials and to reproduce Dhindsa's gas distributor plate is for reducing the periodic replacement of Okayama's gas distributor plate (302; Figure 6; column 13, lines 30-38), further, it is well established that the duplication of parts is obvious (In re Harza , 274 F.2d 669, 124 USPQ 378 (CCPA 1960) MPEP 2144.04).

Response to Arguments

9. Applicant's arguments filed July 20 , 2006 have been fully considered but they are not persuasive.

10. Applicant's arguments are based on the claim amendments as filed. The Examiner's new grounds of rejection clearly address each of Applicant's arguments based on the amendments to the claims.

Conclusion

11. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Art Unit: 1763

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272-1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1763 art unit is (571) 273-8300. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435.

Rudy Zervigon
10/2/c